PIONEER®

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

ORDER NO.
ARP-647-0

AUDIO/VIDEO SELECTOR

VS-60

- This service manual is applicable to the KU type.
- As to the other types, please refer to the additional service manual.

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1. SPECIFICATIONS

		RF section (VHF input/output)	VIDEO section (video input/output)	AUDIO section (audio input/output)
Reference input level/ input impedance		1 Vp-p/75 Ω	1 Vp-p/75 Ω	150 mV/10 kΩ or more
Output level/ Optimum load impedance		1 Vp-p $^{+0}_{-0.5}$ dB/75 Ω	1 Vp-p ±0.5 dB/75 Ω	150 mV $^{+0}_{-3}$ dB/10 kΩ or more
Gain		0 dB		
Frequency response		★ 54 MHz ~ 216 MHz $^{+0}_{-2}$ dB	5 Hz ~ 10 MHz $^{+0}_{-2}$ dB	5 Hz ~ 100 kHz $^{+0}_{-2}$ dB
Crosstalk		60 dB (54 MHz ~ 216 MHz)	45 dB (3.58 MHz)	80 dB (1 kHz)
Channel separation		———	———	75 dB (1 kHz)
S/N ratio		———	55 dB (monitor output)	100 dB (1 V) (IHF-A network, short circuit)
Maximum permissible input		3 V	2 Vp-p	3 V (1 kHz)
Input selector		VCR 1, VCR 2, CATV/AUX, VIDEO DISC		
Recording selector	VCR Copy	———	VCR 1 ► 2, VCR 2 ► 1 CATV/AUX ► VCR 1, 2 VIDEO DISC ► VCR 1, 2	
	Hi-Fi Audio recording	———	———	AUDIO ► VCR 1, 2
Simulated stereo (audio output only)		———	———	ON/OFF
Dynamic noise reduction *DNR (audio output only)		———	———	ON/OFF
VCR 1, VCR 2 audio input/ output terminals		———	———	Stereo/Mono selector switch

★ 54 MHz : 2ch., 216 MHz : 13ch.

ELECTRICAL SECTION, OTHERS

Power requirements
KU, KC models ..... AC 120 volts, 60 Hz
S/G model ..... ~AC 110/120/220/240 volts, 50/60 Hz (Switchable voltage)

Power consumption
..... 12 W
Power outlets x 3 ..... Unswitched, total 500W MAX
External dimensions ..... 420(W) x 60(H) x 215(D) mm.
16-9/16 (W) x 2-3/8 (H) x 8-1/2 (D) in.
Weight ..... 2.8 kg (6 lb 3 oz)

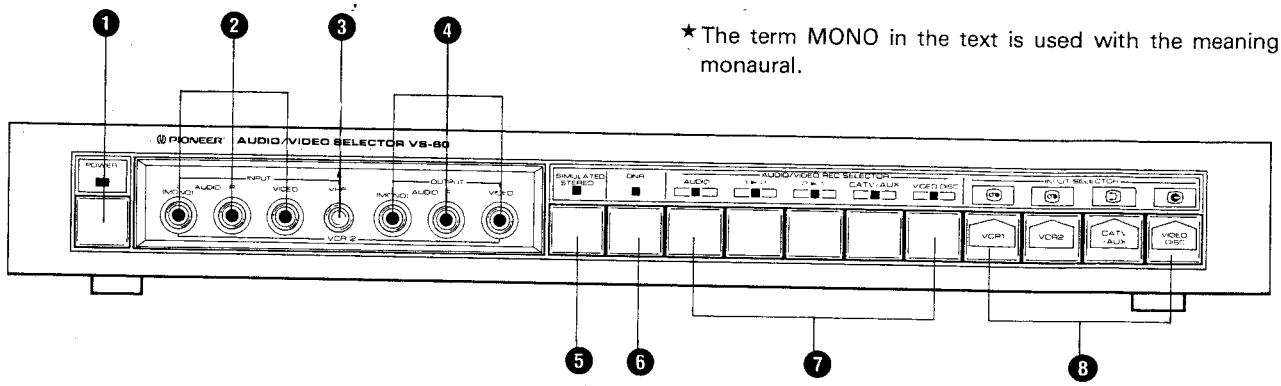
ACCESSORIES:

- Operating Instructions 1
- Warranty card 1
- Audio cord (connection cord with pin plugs) 2
- Coaxial cable with J-type plug 1

NOTE:
Specifications and design subject to possible modification without notice due to improvements.

2. FRONT AND REAR PANEL FACILITIES

FRONT



★The term MONO in the text is used with the meaning c monaural.

❶ POWER switch/POWER indicator

When this switch is depressed, the power indicator lights red, and power is supplied to the unit. To turn power off, press once again.

❷ VCR 2 INPUT terminals (AUDIO/VIDEO-L (MONO), R)

A VCR with multichannel television sound may be connected. When a monaural audio source is connected, connect the pin plug to the L (MONO) terminal only. A switch built into the terminal will switch the unit to monaural.

❸ VCR 2 VHF INPUT terminal

To input a VCR output signal from an RF (VHF) output terminal, connect to this input terminal using an F-type plug (sold separately). This can be used in the same way as the rear panel VHF IN (VCR 1). The input RF signal can be watched on a normal television receiver connected through the VHF output terminal.

❹ VCR 2 OUTPUT terminals (AUDIO/VIDEO-L (MONO), R)

These terminals constantly output the video and audio signals of the source presently being viewed. When recording with a second VCR (portable video, etc.), a pin cord is used to connect these output terminals to the VCR's input terminals. Also, when a VCR is connected to the rear panel VCR 1 IN terminals, the playback is output through the VCR 2 OUTPUT terminals, thus allowing video copying. When using a monaural source, connect the pin cord to the L (left) audio input terminal only. A switch built into the terminal automatically switches the unit to monaural.

❺ SIMULATED STEREO switch

This switch allows normal monaural signals to be heard in simulated stereo sound. Use it, for example, when you wish to listen to a monaural VCR with the full sound normally characteristic of stereo.

NOTE:
If this function is used during normal stereo playback, an unnatural stereo effect may be produced.

❻ DNR★ switch (Dynamic Noise Reduction

The DNR function reduces easily heard high-range nois components.
During video playback, if you notice high-range hissin noise, press this switch to produce easier listening.

NOTE:
- *This switch functions with the source selected with the inpu selector, and affects the audio output. It is unrelated to th video/audio recording selector.*
- *The degree of high frequency noise reduction depends on th kind of tape used, the recording level, and other conditions.*

❼ AUDIO/VIDEO REC SELECTOR

This selector allows you to select the video componen source input to and output from this unit when recording The video (or audio) are output simultaneously from the VCF 1 and VCR 2 output terminals. However, a special circuit is provided so that during 1 ∼2 recording, no signal is output tc 1, and during 2 ∼ 1 recording, no signal is output to 2.

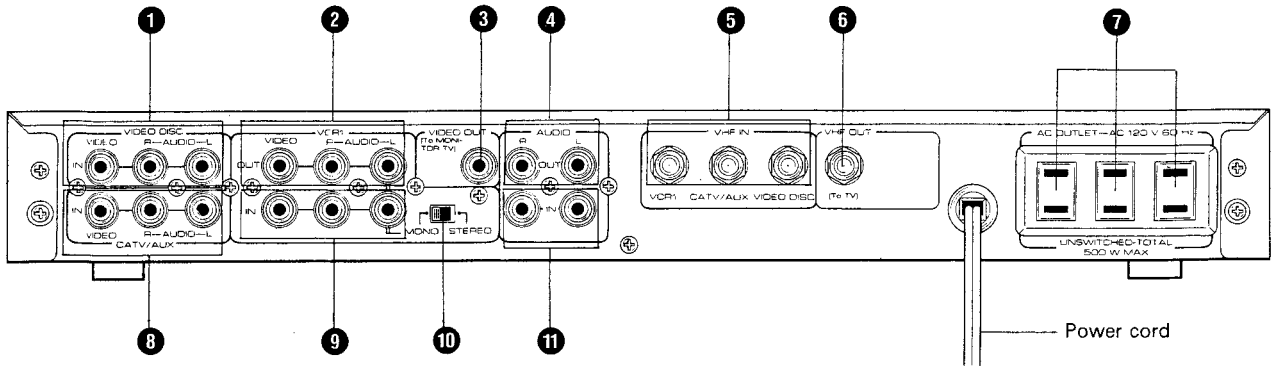
AUDIO:	To record audio signals input to the audio input terminals (L,R) on a Hi-F VCR.
1 ► 2:	To record VCR 1 playback signals on VCR 2.
2 ► 1:	To record VCR 2 playback signals on VCR 1.
CATV/AUX:	To record from a video component such as a personal computer's character data or CATV broadcast.
VIDEO DISC:	To record from a video disc player.

❽ INPUT SELECTORS

These selectors are used to choose the various video input components connected to the unit.

Recordings from television programs, records or other materials may be made for your personal entertainment only; other uses may constitute infringement of copyright laws

REAR



❶ VIDEO DISC IN terminals (VIDEO/AUDIO-L, R)

Use for connecting a video disc player.

❷ VCR 1 OUT terminals (VIDEO/AUDIO-L, R)

The video and audio signals from the source presently being viewed are output constantly from these terminals. Use a pin cord to connect to the input terminals of a VCR with multichannel television sound. When connecting a VCR to the front panel VCR 2 INPUT terminals, the playback is output at the VCR 1 OUT terminals, thus allowing video copying. When the audio channel is monaural, see item ❿ regarding the MONO/STEREO selector switch.

❸ VIDEO OUT terminal (To MONITOR TV)

The video signals from the video components connected to the input terminals are output here in accordance with the INPUT SELECTORS. Connect to the video input terminal of a monitor television.

❹ AUDIO OUT terminals (L, R)

Audio signals from the various video components connected to the input terminals are output here. Connect to your stereo amplifier's TAPE PLAY (INPUT) terminals. Also, when used in combination with the Pioneer Component Display (e.g. SD-25), these terminals may be connected to the audio input terminals on the rear of the display.

❺ VHF IN terminals (VCR 1, CATV/AUX, VIDEO DISC)

When you wish to use a normal television receiver to watch programs from a video component, connect these terminals to the RF converter output (Ch3 or Ch4) of the various components.

VCR 1: Connect to the RF output of VCR 1.

CATV/AUX: Connect to RF output of a CATV terminal converter or other video component.

VIDEO DISC: Connect to RF output of video disc player.

❻ VHF OUT terminal (To TV)

When you wish to use a normal television receiver to watch programs from a video component, in addition to connecting the various video components' RF ouptut to the VHF input terminals, connect this terminal to the television's VHF antenna terminal.

> When the unit's power is OFF, the RF output signal of the component connected to the VHF input terminal VCR 1 is input directly to the television (regardless of the INPUT SELECTOR setting). Accordingly, VCR 1 can be used even when the power to the VS-60 is turned OFF, and your television set can also be used normally.

❼ AC OUTLET – AC 120 V 60 Hz (UNSWITCHED – TOTAL 500 W MAX)

These outlets may be used to connect the power plugs of your video components. The combined consumption of the connected components should not exceed 500 W.

❽ CATV/AUX IN terminals

Use to connect a cable television converter or other video component.

❾ VCR 1 IN terminals (AUDIO/VIDEO-L, R)

Use to connect a VCR with multichannel television sound.

❿ MONO/STEREO selector switch

When connecting a VCR with monaural audio output, use a single pin cord connected to the VCR 1 AUDIO L channel, and set the audio selector switch to the MONO position. Normally, leave in the STEREO position.

⓫ AUDIO IN terminals (L, R)

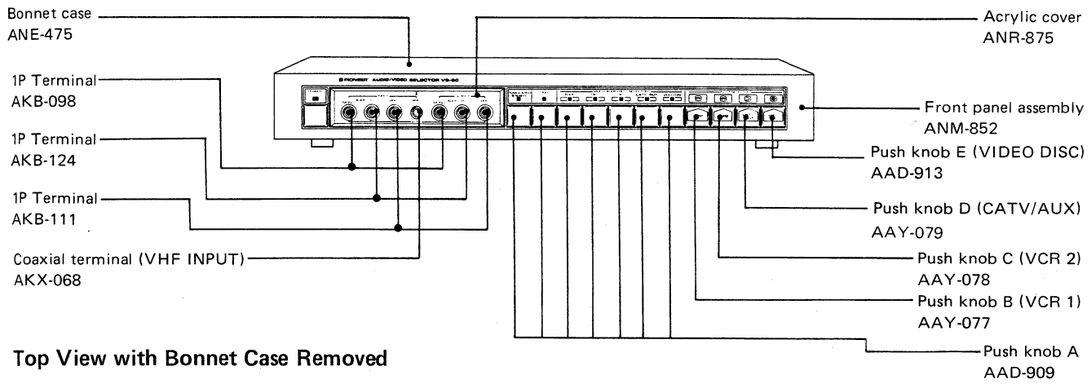
Normally, connect to the TAPE REC (OUTPUT) terminals of your stereo amplifier. The audio output of other components (e.g. compact disc player) may also be connected here.

3. PARTS LOCATION

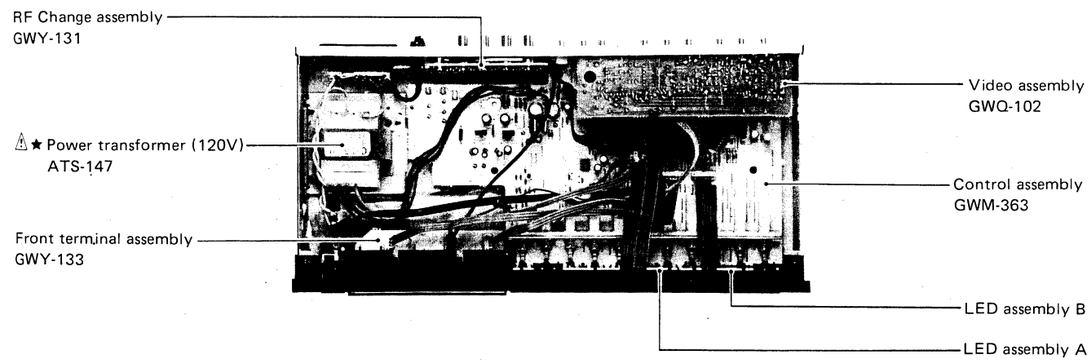
NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

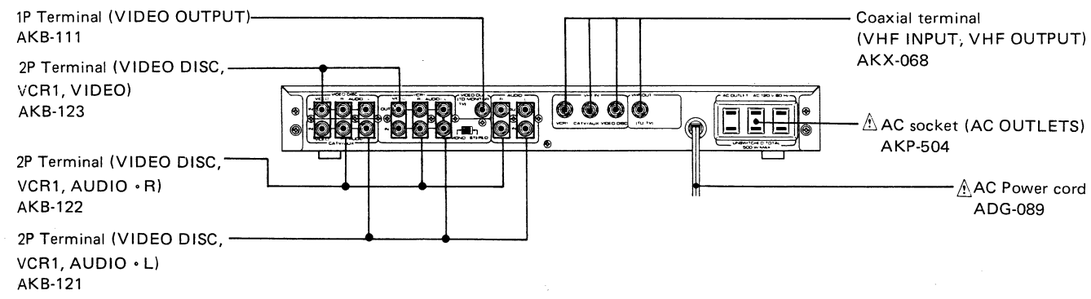
Front panel



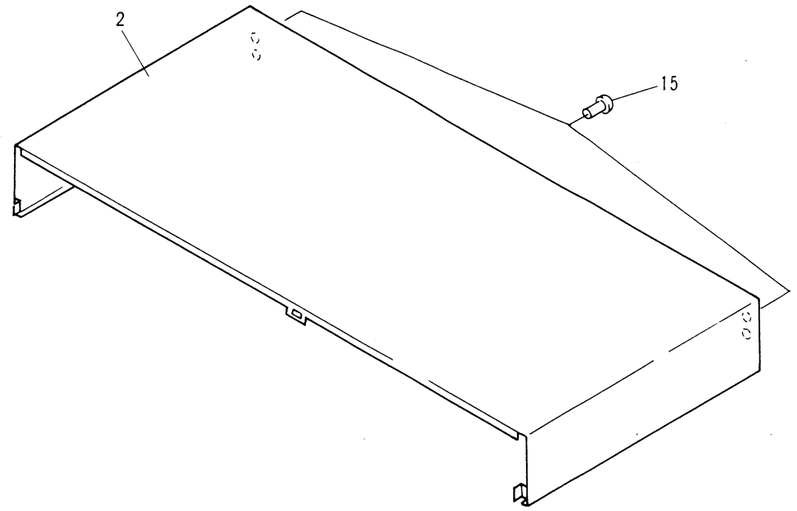
Top View with Bonnet Case Removed

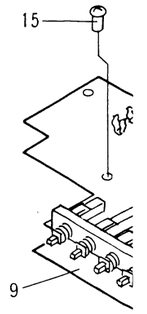


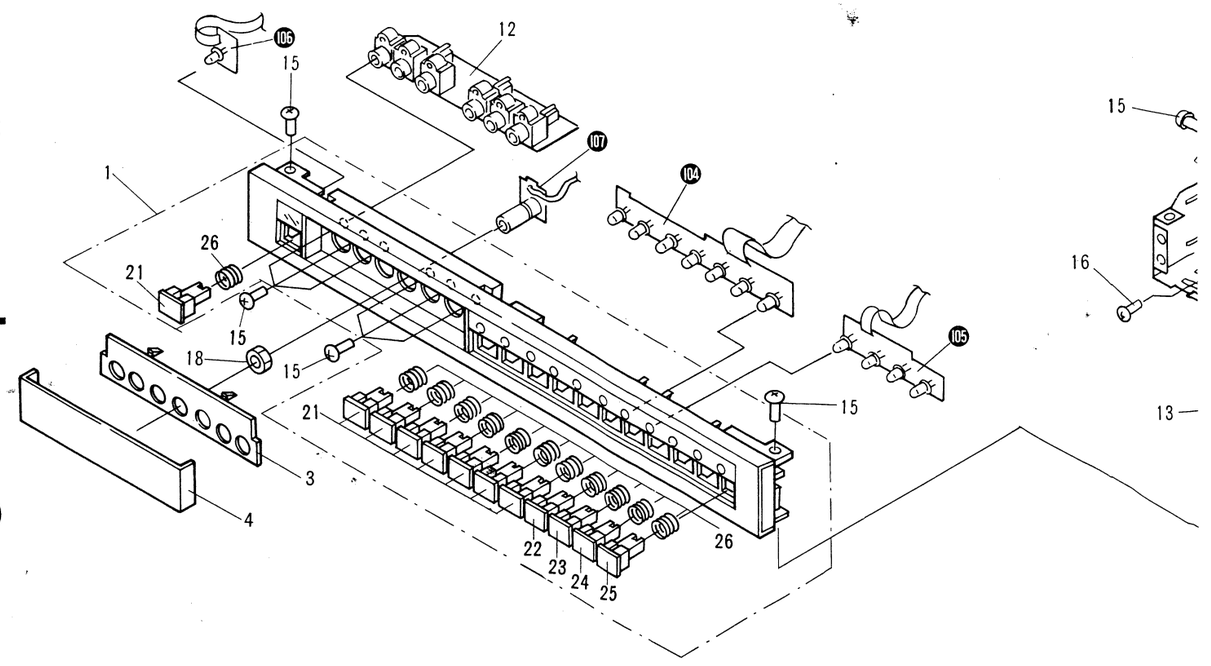
Rear Panel

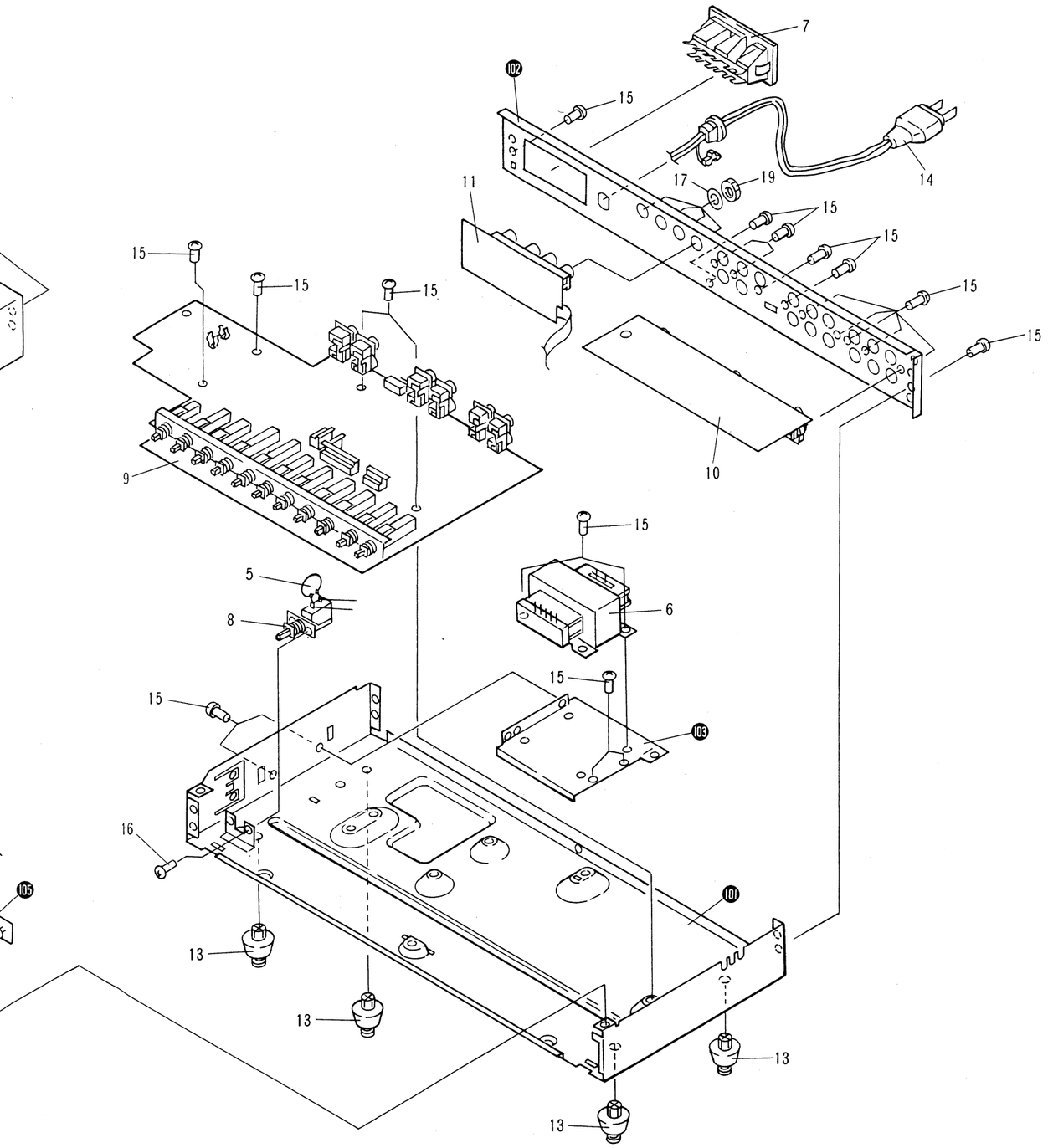


4. EXPLODED VIEW









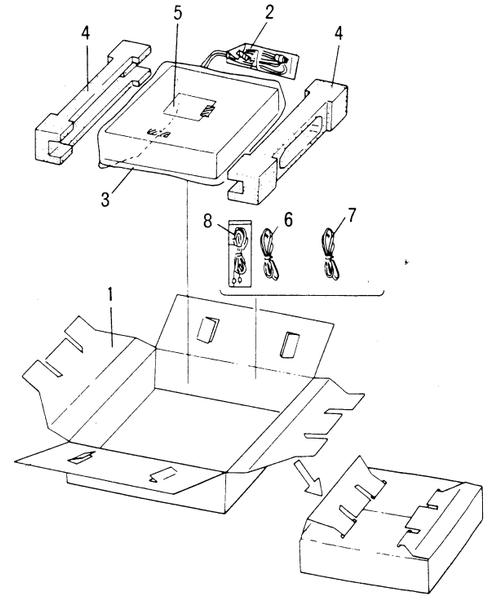
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List of Exploded View

Mark	No.	Part No.	Description	Mark	No.	Part No.	Description
	1.	ANM-852	Front panel assembly		21.	AAD-909	Push knob A
	2.	ANE-475	Bonnet case		22.	AAY-077	Push knob B (VCR1)
	3.	ANM-854	Sub-panel		23.	AAY-078	Push knob C (VCR2)
	4.	ANR-875	Acrylic cover		24.	AAY-079	Push knob D (CATV/AUX)
⚠	5.	ACG-001	Ceramic capacitor (C401)		25.	AAD-913	Push knob E (VIDEO DISC)
⚠	★ 6.	ATS-147	Power transformer (120V)		26.	ABH-139	Coil spring
⚠	7.	AKP-504	AC socket (AC OUTLETS)		101.		Chassis
⚠	★★ 8.	ASG-541	Push switch (S5, POWER)		102.		Rear panel
	9.	GWM-363	Control assembly		103.		Transformer stay
	10.	GWQ-102	Video assembly		104.		LED assembly A
	11.	GWY-131	RF change assembly		105.		LED assembly B
	12.	GWY-133	Front terminal assembly		106.		Power IND. assembly
	13.	AEP-016	Leg assembly		107.		RF terminal assembly
⚠	14.	ADG-089	AC power cord				
	15.	BBZ30P080FZK	Screw 3 x 8				
	16.	VMZ30P060FMC	Screw 3 x 6				
	17.	WAX0F160N100	Washer				
	18.	ABN-059	Nut				
	19.	ABN-087	Nut				
	20.	BBZ30P060FZK					

5. PACKING

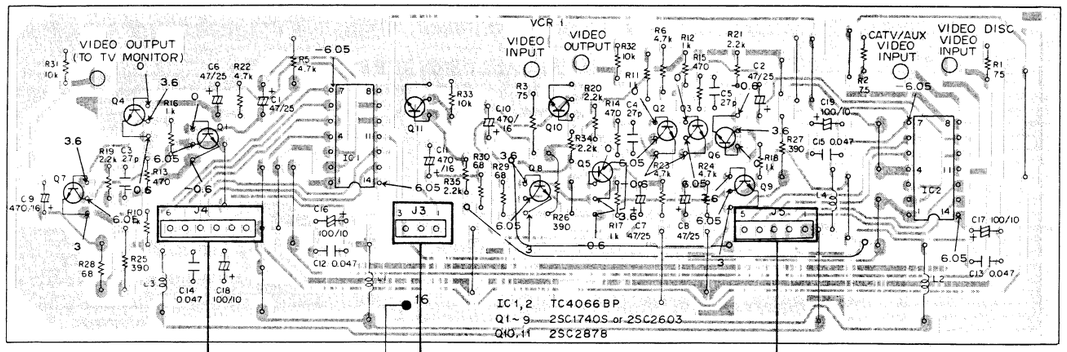


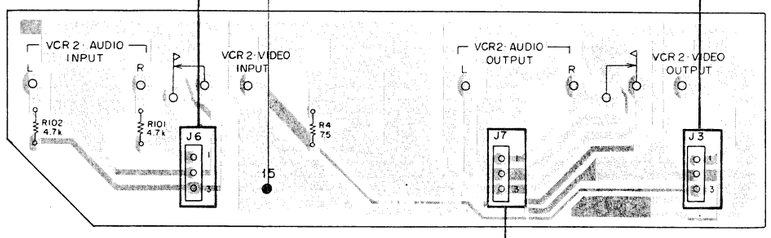
Parts List of Packing

Mark	No.	Part No.	Description
	1.	AHE-454	Packing case assembly
	2.	AHG-023	Vinyl bag
	3.	AHG-125	Sheet
	4.	AHA-376	Side pad
	5.	ARB-633	Operating instructions (English)
	6.	ADE-072	Connector cord (with plug)
	7.	ADE-073	Connector cord (with plug)
	8.	AEA-057	Cable

6. P.C. BOARDS CONNECTION DIAGRAM

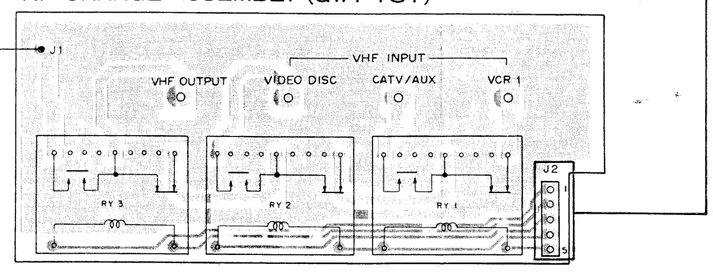
VIDEO ASSEMBLY (GWQ-102)

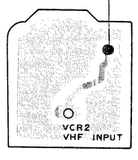




FRONT TERMINAL ASSEMBLY (GWY-133)

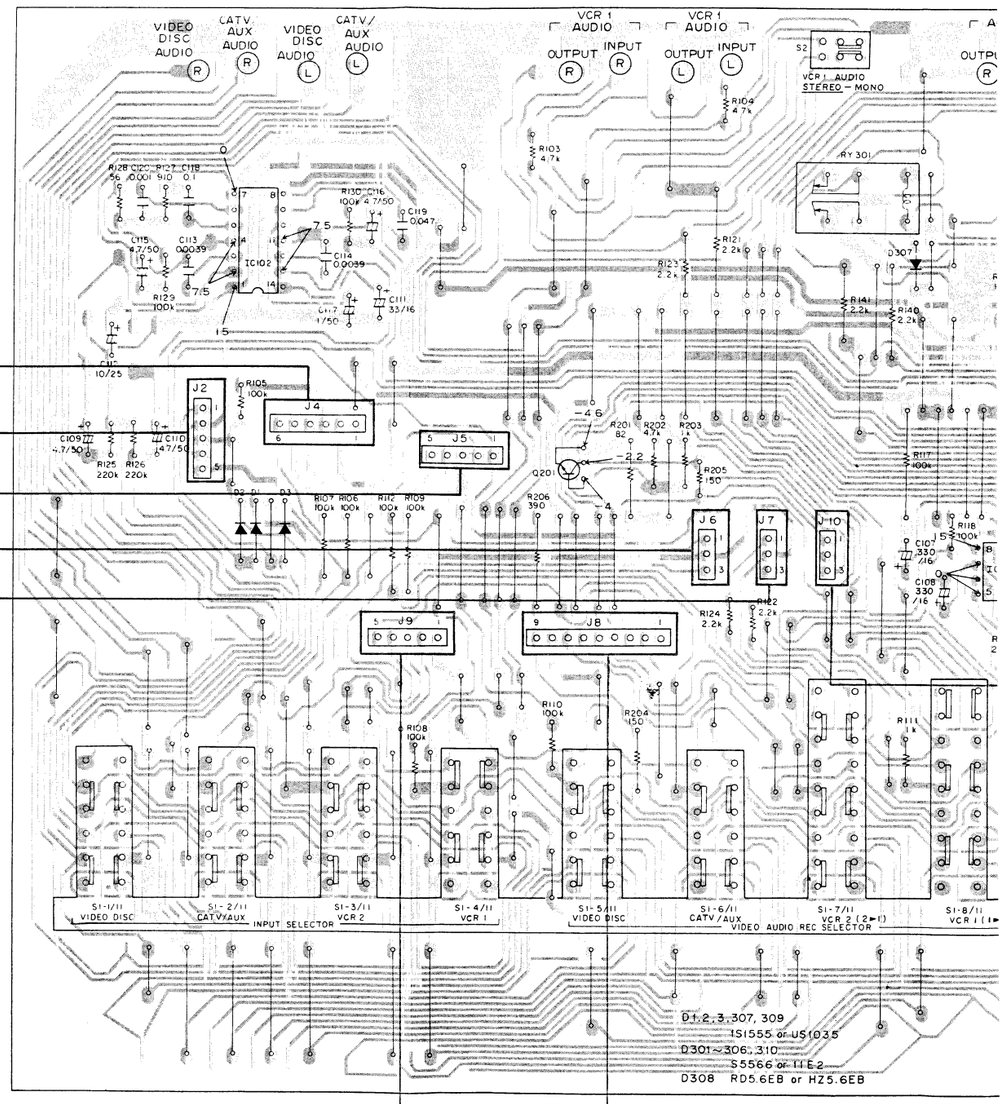
RF CHANGE ASSEMBLY (GWY-131)

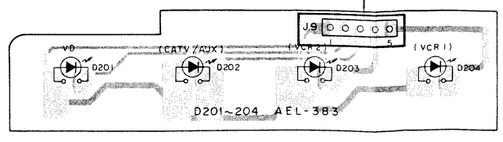




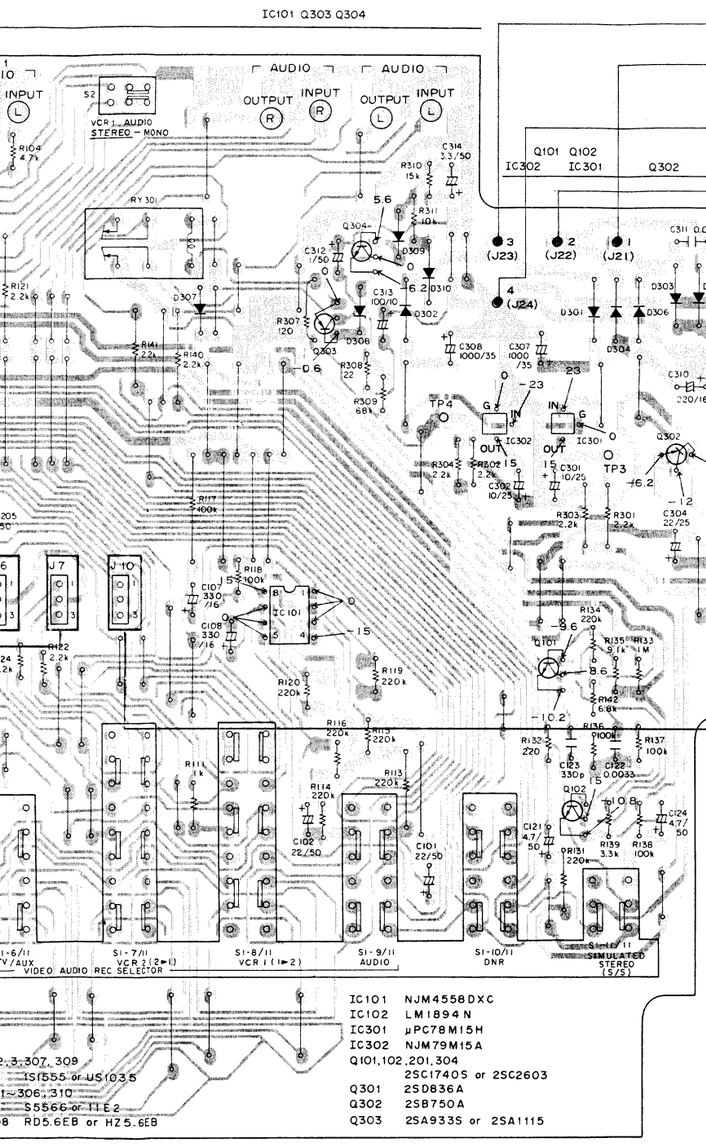
RF TERMINAL ASSEMBLY

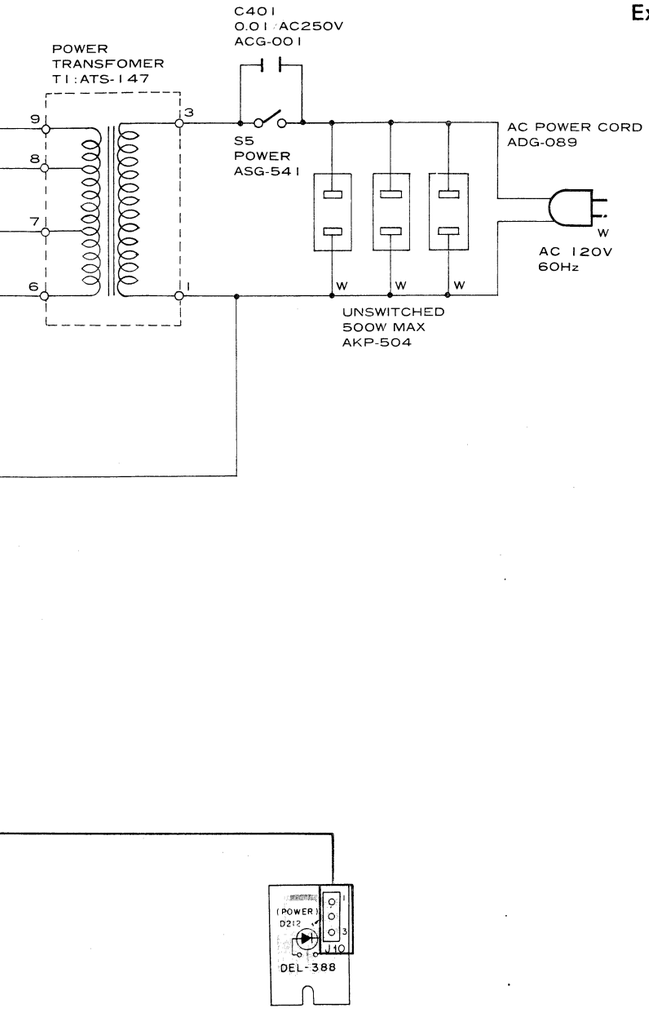
CONTROL ASSEMBLY (GWM-363)



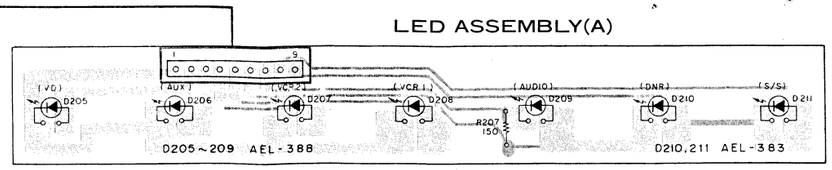


LED ASSEMBLY(B)



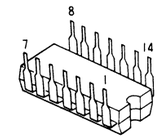


POWER IND. ASSEMBLY

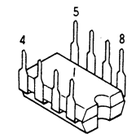


External Appearance of Transistors and ICs

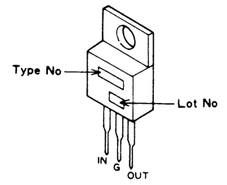
LM1894N
TC4066BP



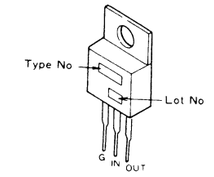
NJM4558DXC



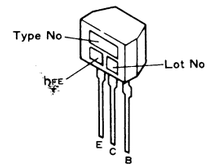
μPC78M15H



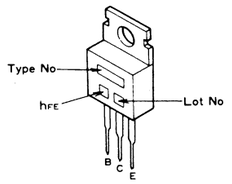
NJM79M15A



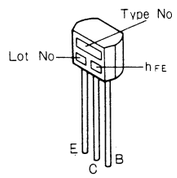
2SA933S
2SC1740S



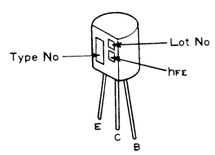
2SB750A
2SD836A



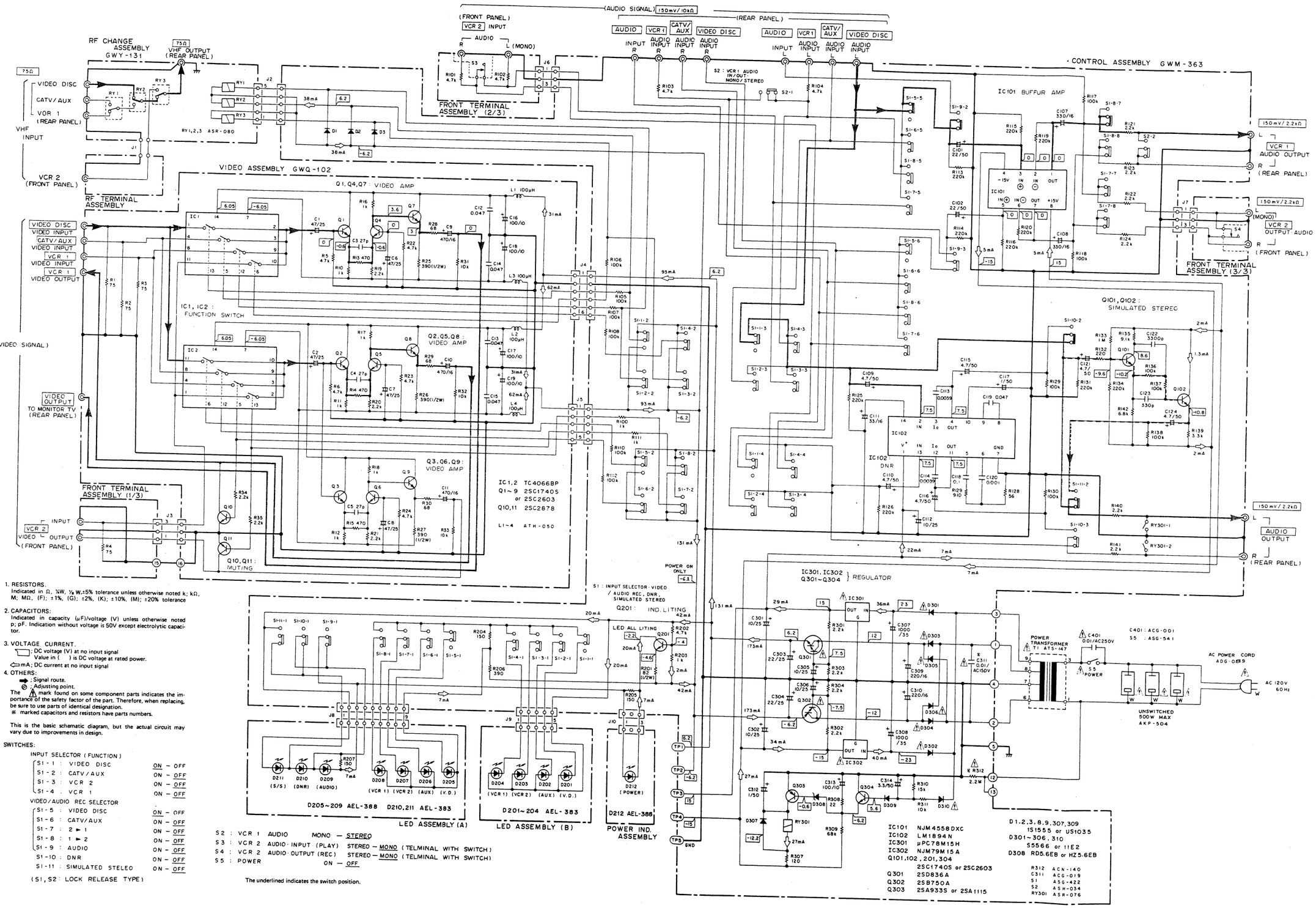
2SA1115
2SC2603



2SC2878



7. SCHEMATIC DIAGRAM



1. RESISTORS.
Indicated in Ω, ¼W, ½ W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); ±2%, (K); ±10%, (M); ±20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT.
: DC voltage (V) at no input signal
Value in ( ) is DC voltage at rated power.
⇦mA; DC current at no input signal

4. OTHERS:
➡ : Signal route.
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:

INPUT SELECTOR (FUNCTION)

S1-1	VIDEO DISC	ON – OFF
S1-2	CATV/AUX	ON – OFF
S1-3	VCR 2	ON – OFF
S1-4	VCR 1	ON – OFF

VIDEO/AUDIO REC SELECTOR

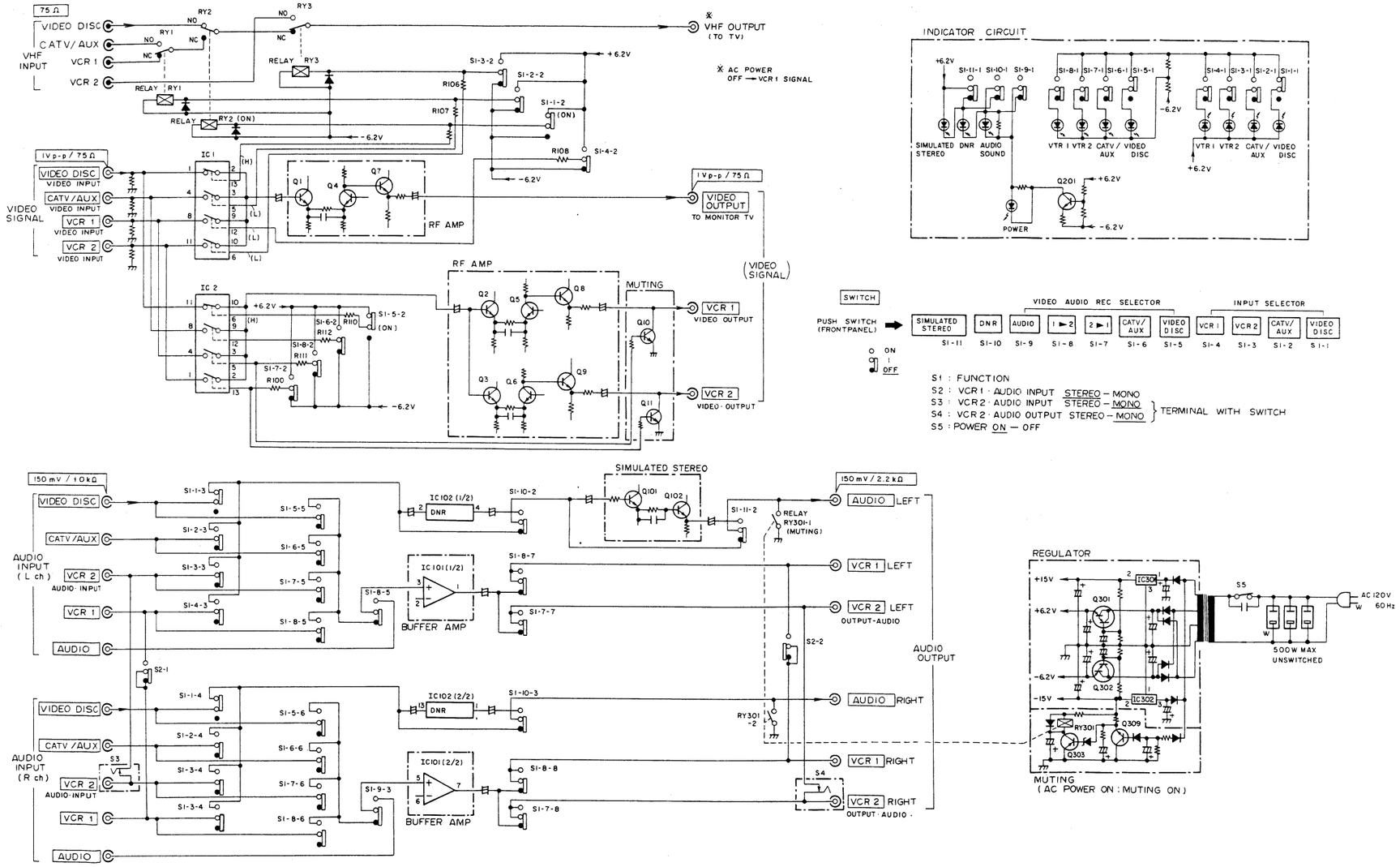
S1-5	VIDEO DISC	ON – OFF
S1-6	CATV/AUX	ON – OFF
S1-7	2 ► 1	ON – OFF
S1-8	1 ► 2	ON – OFF
S1-9	AUDIO	ON – OFF
S1-10	DNR	ON – OFF
S1-11	SIMULATED STELEO	ON – OFF

(S1, S2 : LOCK RELEASE TYPE)

S2 : VCR 1 AUDIO MONO – STEREO
S3 : VCR 2 AUDIO INPUT (PLAY) STEREO – MONO (TELMINAL WITH SWITCH)
S4 : VCR 2 AUDIO OUTPUT (REC) STEREO – MONO (TELMINAL WITH SWITCH)
S5 : POWER ON – OFF

The underlined indicates the switch position.

8. BLOCK DIAGRAM



9. CIRCUIT DESCRIPTION

DNR* Circuit

The DNR (Dynamic Noise Reduction) circuit suppresses noise by varying cut-off frequency of the low-pass filter in accordance with the input signal level.

S1 : FUNCTION
S2 : VCR1 · AUDIO INPUT STEREO — MONO
S3 : VCR2 · AUDIO INPUT STEREO — MONO } TERMINAL WITH SWITCH
S4 : VCR2 · AUDIO OUTPUT STEREO — MONO
S5 : POWER ON — OFF

The DNR system utilizes two principles: one is that audible noise intensity is proportional to bandwidth, the other is "masking" effect.
When the amplitude of high frequency component of input signal is relatively small and includes much audible noise, the pass bandwidth is reduced (to about 1kHz minimum). When input signal contains adequate high frequency component with less noise, the pass bandwidth is increased to maximum 34kHz because noise is masked by the high frequency component.

Fig. 9-1 shows the block diagram of the DNR IC. The upper half of the diagram illustrates the low-pass filter. It consists of the current control transconductance amplifier (which changes its output current according to input voltage, enabling control of sensitivity by external current), the operational amplifier and externally installed capacitors. The low-pass filter varies the cut-off frequency according to the amount of current supplied from the circuit illustrated in the lower half of the block diagram.

The control current is produced by the lower half circuit in the diagram.

Input signals from A and B are amplified by the summing amplifier, then the high frequency component alone is amplified. The high-pass filter (whose cut-off frequency is about 6kHz) consists of the capacitor and resistor connected to pin 6. The peak voltage detector samples the peak voltage of the input signal, and the voltage-current converter converts the voltage into current. The produced current is supplied to the current control transconductance amplifiers.

* ● *"The DNR Dynamic Noise Reduction System is authorized for use by National Semiconductor Corporation."*
● *"DNR is trademark of National Semiconductor Corporation.*

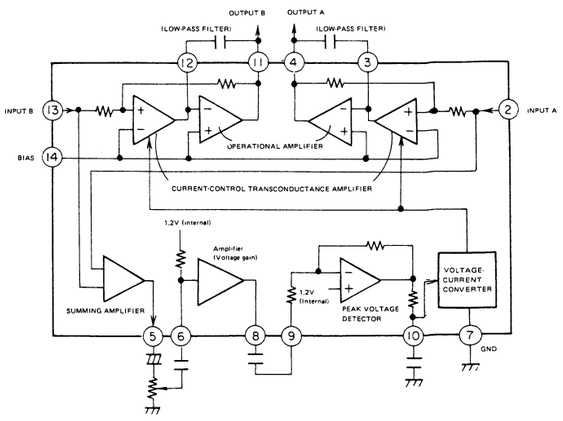


Fig. 9-1 DNR IC Block Diagram.

10. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561 .....*	*RD¼PS 5601 J*
47kΩ	*47 × 10³*	*473 .....*	*RD¼PS 4703 J*
0.5Ω	*0R5 .....*		*RN2H 0R50 K*
1Ω	*010 .....*		*RS1P 0100 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621 ....*	*RN¼SR 56201 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Miscellaneous Parts

P.C. Board Assembly

Mark	Symbol & Description	Part No.
	Control assembly	GWM-363
	Video assembly	GWQ-102
	RF change assembly	GWY-131
	Front terminal assembly	GWY-133
	LED assembly A	Non supply
	LED assembly B	Non supply
	Power IND. assembly	Non supply
	RF terminal assembly	Non supply

OTHERS

Mark	Symbol & Description		Part No.
⚠	C401	Ceramic capacitor (0.01/AC250V)	ACG-001 (ACG-502)
⚠ ★	T1	Power transformer (120V)	ATS-147
⚠		AC socket (AC OUTLETS)	AKP-504
⚠ ★★	S5	Push switch (POWER)	ASG-541
⚠		AC power cord	ADG-089

Control Assembly (GWM-363)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC101	NJM4558DXC
★★	IC102	LM1894N
⚠ ★★	IC301	μPC78M15H
⚠ ★★	IC302	NJM79M15A
★★	Q101, Q102, Q201, Q304	2SC1740S (2SC2603)
⚠ ★★	Q301	2SD836A
⚠ ★★	Q302	2SB750A
★★	Q303	2SA933S (2SA1115)
★	D1 – D3, D307, D309	1S1555 (US1035)
⚠ ★	D301 – D306, D310	S5566 (11E2)
★	D308	RD5.6EB (HZ5.6EB)

SWITCHES, RELAY

Mark	Symbol & Description		Part No.
★★	S1	Push switch (INPUT SELECTOR/VIDEO AUDIO SELECTOR)	ASG-422
★★	S2	Slide switch (VCR1 REC • PLAY STEREO/MONO)	ASH-034
★★	RY301	Relay	ASR-076

CAPACITORS

Mark	Symbol & Description	Part No.
	C101, C102	CEA 220M 50L
⚠	C311 Ceramic capacitor (0.01/AC150V)	ACG-019
	C109, C110, C115, C116, C121, C124	CEANL 4R7M 50
	C307, C308	CEAS 102M 35
	C117, C312	CEA 010M 50L
	C112, C301, C302, C305, C306	CEA 100M 25L
	C313	CEA 101M 10L
	C303, C304	CEA 220M 25L
	C309, C310	CEA 221M 16L
	C314	CEA 3R3M 50L
	C111	CEA 330M 16L
	C123	CKDYB 331K 50
	C120	CQMA 102J 50
	C118	CQMA 104J 50
	C122	CQMA 332J 50
	C113, C114	CQMA 392J 50
	C119	CQMA 473J 50
	C107, C108	CEA 331M 16L

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
⚠	R312 Carbon composition (2.2M)	ACN-140
	R201	RD1/2PMF820J
	R307	RD1/4PM121J
	Other resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	2P Terminal (LEFT, white)	AKB-121
	2P Terminal (RIGHT, red)	AKB-122

Video Assembly (GWQ-102)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1, IC2	TC4066BP
★★	Q1 – Q9	2SC1740S (2SC2603)
★★	Q10, Q11	2SC2878

COILS

Mark	Symbol & Description	Part No
	L1 – L4	ATH-500

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C2, C6 – C8	CEA 470M 25L
	C3 – C5	CCDSL 270J 50
	C9 – C11	CEA 471M 16
	C16 – C19	CEA 101M 10L
	C12 – C15	CKDYX 473M 25

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R25 – R27	RD1/2PMF391J
	Other resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	1P Terminal (VIDEO OUTPUT)	AKB-111
	2P Terminal (Yellow) (VCR1, VIDEO)	AKB-123

RF Change Assembly (GWY-131)

RELAYS

Mark	Symbol & Description	Part No.
★★	RY1 – RY3 Relay	ASR-080 (ASR-081)

OTHERS

Mark	Symbol & Description	Part No.
	Coaxial terminal (VHF INPUT, OUTPUT)	AKX-068

RF Terminal Assembly

OTHERS

Mark	Symbol & Description	Part No.
	Coaxial terminal (VHF INPUT)	AKX-068

Front Terminal Assembly (GWY-133)

RESISTORS

Mark	Symbol & Description	Part No.
	R101, R102	RD1/8PM472J
	R4	RD1/8PM750J

OTHERS

Mark	Symbol & Description	Part No.
	1P Terminal (INPUT • L)	AKB-098
	1P Terminal (INPUT • VIDEO)	AKB-111
	1P Terminal (Red) (INPUT • R)	AKB-124

10. ELECTRICAL PARTS LIST

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47kΩ	*47 × 10³*	*473*	*RD¼PS 4733 J*
0.5Ω	*0R5*		*RN2H 0R50 K*
1Ω	*010*		*RS1P 0100 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR 5621 F*

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	Video assembly	GWQ-102
	RF change assembly	GWY-131
	Front terminal assembly	GWY-133
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	LED assembly B	Non supply
	Power IND. assembly	Non supply
	RF terminal assembly	Non supply

OTHERS

Mark	Symbol & Description		Part No.
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⚠ ★	T1	Power transformer (120V)	ATS-147
⚠		AC socket (AC OUTLETS)	AKP-504
⚠ ★★	S5	Push switch (POWER)	ASG-541
⚠		AC power cord	ADG-089

Control Assembly (GWM-363)

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⚠ ★★	IC301	μPC78M15H
⚠ ★★	IC302	NJM79M15A
★★	Q101, Q102, Q201, Q304	2SC1740S (2SC2603)
⚠ ★★	Q301	2SD836A
⚠ ★★	Q302	2SB750A
★★	Q303	2SA933S (2SA1115)
★	D1 – D3, D307, D309	1S1555 (US1035)
⚠ ★	D301 – D306, D310	S5566 (11E2)
★	D308	RD5.6EB (HZ5.6EB)

SWITCHES, RELAY

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★★	S1	Push switch (INPUT SELECTOR/VIDEO AUDIO SELECTOR)	ASG-422
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	C307, C308	CEAS 102M 35
	C117, C312	CEA 010M 50L
	C112, C301, C302, C305, C306	CEA 100M 25L
	C313	CEA 101M 10L
	C303, C304	CEA 220M 25L
	C309, C310	CEA 221M 16L
	C314	CEA 3R3M 50L
	C111	CEA 330M 16L
	C123	CKDYB 331K 50
	C120	CQMA 102J 50
	C118	CQMA 104J 50
	C122	CQMA 332J 50
	C113, C114	CQMA 392J 50
	C119	CQMA 473J 50
	C107, C108	CEA 331M 16L

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
⚠	R312 Carbon composition (2.2M)	ACN-140
	R201	RD1/2PMF820J
	R307	RD1/4PM121J
	Other resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	2P Terminal (LEFT, white)	AKB-121
	2P Terminal (RIGHT, red)	AKB-122

Video Assembly (GWQ-102)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1, IC2	TC4066BP
★★	Q1 – Q9	2SC1740S (2SC2603)
★★	Q10, Q11	2SC2878

COILS

Mark	Symbol & Description	Part No
	L1 – L4	ATH-500

CAPACITORS

Mark	Symbol & Description	Part No.
	C1, C2, C6 – C8	CEA 470M 25L
	C3 – C5	CCDSL 270J 50
	C9 – C11	CEA 471M 16
	C16 – C19	CEA 101M 10L
	C12 – C15	CKDYX 473M 25

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Symbol & Description	Part No.
	R25 – R27	RD1/2PMF391J
	Other resistors	RD1/8PM □□□J

OTHERS

Mark	Symbol & Description	Part No.
	1P Terminal (VIDEO OUTPUT)	AKB-111
	2P Terminal (Yellow) (VCR1, VIDEO)	AKB-123

RF Change Assembly (GWY-131)

RELAYS

Mark	Symbol & Description	Part No.
★★	RY1 – RY3 Relay	ASR-080 (ASR-081)

OTHERS

Mark	Symbol & Description	Part No.
	Coaxial terminal (VHF INPUT, OUTPUT)	AKX-068

RF Terminal Assembly

OTHERS

Mark	Symbol & Description	Part No.
	Coaxial terminal (VHF INPUT)	AKX-068

Front Terminal Assembly (GWY-133)

RESISTORS

Mark	Symbol & Description	Part No.
	R101, R102	RD1/8PM472J
	R4	RD1/8PM750J

OTHERS

Mark	Symbol & Description	Part No.
	1P Terminal (INPUT • L)	AKB-098
	1P Terminal (INPUT • VIDEO)	AKB-111
	1P Terminal (Red) (INPUT • R)	AKB-124

LED Assembly A

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D205 – D209 LED (Red)	AEL-388
★	D210, D211 LED (Green)	AEL-383

RESISTORS

Mark	Symbol & Description	Part No.
	R207	RD1/8PM151J

LED Assembly B

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D201 – D204 LED (Red)	AEL-383

Power IND. Assembly

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D212 LED (Red)	AEL-388

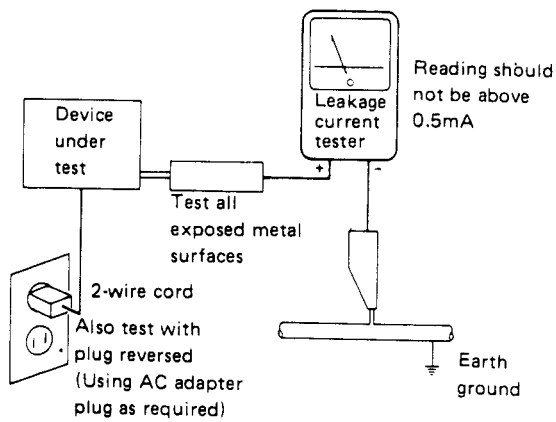
11. SAFETY INFORMATION

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technical.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.